NBS
PUBLICATIONS

FIPS PUB **123**

FEDERAL INFORMATION
PROCESSING STANDARDS PUBLICATION

1986 September 19

U.S. DEPARTMENT OF COMMERCE/National Bureau of Standards

FIPS

FEDERAL INFORMATION · PROCESSING STANDARDS

SPECIFICATION FOR A DATA
DESCRIPTIVE FILE FOR
INFORMATION INTERCHANGE (DDF)

CATEGORY: SOFTWARE STANDARD
SUBCATEGORY: INFORMATION INTERCHANGE

Foreword

The Federal Information Processing Standards Publication Series of the National Bureau of Standards is the official publication relating to standards, guidelines, and documents adopted and promulgated under the provisions of Public Law 89-306 (Brooks Act) and under Part 6 of Title 15, Code of Federal Regulations. These legislative and executive mandates have given the Secretary of Commerce important responsibilities for improving the utilization and management of computers and automatic data processing in the Federal Government. To carry out the Secretary's responsibilities, the NBS, through its Institute for Computer Sciences and Technology, provides leadership, technical guidance, and coordination of Government efforts in the development of standards, guidelines, and documents in these areas.

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Institute for Computer Sciences and Technology

Abstract

This publication announces the adoption of the ANSI/ISO 8211-1985, Specification for a Data Descriptive File for Information Interchange (DDF), as a Federal Information Processing Standard (FIPS). ANSI/ISO 8211-1985 specifies media-independent and system-independent file and record formats for the interchange of information between computer systems. The standard is intended for use with physical media as well as with communications media in applications where a high volume of data is to be interchanged, rather than for an isolated interchange of a single or small number of records. The purpose of the standard is to provide a mechanism to allow data structures to be easily transported from one computer system to another computer system, independent of make, with the capability of restructuring the data without loss of content or meaning. The standard is for use by implementors and users who have a need to represent data structures and data definitions in a standard format for information interchange purposes so that the data can be transported from one system to another while maintaining the integrity of the data.

Key words: ANSI/ISO 8211-1985; data conversion; data descriptive file; DDF; data interchange; data translation; Federal Information Processing Standards Publication; information interchange; interchange format; ISO 8211-1985; software standards.
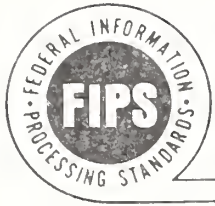
Federal Information
Processing Standards Publication 123

1986 September 19

Announcing the Standard for

SPECIFICATION FOR A DATA DESCRIPTIVE FILE FOR
INFORMATION INTERCHANGE (DDF)

Federal Information Processing Standards Publications (FIPS PUBS) are issued by the National Bureau of Standards pursuant to Section 111 (f) (2) of the Federal Property and Administrative Services Act of 1949, as amended, Public Law 89-306 (79 Stat. 1127), Executive Order 11717 (38 FR 12315, dated May 11, 1973), and Part 6 of Title 15 Code of Federal Regulations (CFR).

1. Name of Standard. Specification for a Data Descriptive File for Information Interchange (DDF) (FIPS PUB 123).

2. Category of Standard. Software Standard, Information Interchange.

3. Explanation. This publication announces the adoption of the ANSI/ISO 8211-1985, Specification for a Data Descriptive File for Information Interchange (DDF), as a Federal Information Processing Standard (FIPS). ANSI/ISO 8211-1985 specifies media-independent and system-independent file and record formats for the interchange of information between computer systems. The standard is intended for use with physical media as well as with communications media in applications where a high volume of data is to be interchanged, rather than for an isolated interchange of a single or small number of records. The purpose of the standard is to provide a mechanism to allow data structures to be easily transported from one computer system to another computer system, independent of make, with the capability of restructuring the data without loss of content or meaning. The standard is for use by implementors and users who have a need to represent data structures and data definitions in a standard format for information interchange purposes so that the data can be transported from one system to another while maintaining the integrity of the data.

4. Approving Authority. Secretary of Commerce.

5. Maintenance Agency. Department of Commerce, National Bureau of Standards (Institute for Computer Sciences and Technology).

6. Cross Index. ANSI/ISO 8211-1985. Specification for a Data Descriptive File for Information Interchange (DDF).

7. Objectives. The primary objectives of this standard are:
- to permit data structures, data files, data definitions, and databases to be easily transported from one computer system to another computer system, where the two systems are not necessarily compatible, without loss of content or meaning.
- to reduce the cost of information interchange when data must be transported from one computer system to another computer system where the two systems are not necessarily compatible.
- to provide a standard interchange format when migration from one computer system to another computer system occurs.
- to provide a standard interchange format for archiving data for future recall by assuring that standard software will be available for this purpose.

8. Applicability.
   a. This standard is intended for use in information interchange applications that are either developed or acquired for government use. Is is suitable for representing and interchanging a broad spectrum of data structures including: elementary data, vectors, arrays, and hierarchies. User file structures such as sequential, hierarchical, relational, and indices can be converted into the interchange format.

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Knowledge of the user file structure is required in order to develop the application interface that is necessary for converting the user file into the interchange format. Network structures can be interchanged but additional pre-processing and post-processing is necessary to preserve logical linkages. The data to be interchanged can be in character representation or binary representation. The intermediate structure through which the information passes is designed for interchange purposes only and is not intended to be used for general processing. This standard should be used unless a more efficient or cost effective alternative already exists. It is recognized that programmatic requirements may be more economically and efficiently satisfied through the use of more specialized data interchange software such as the Initial Graphics Exchange System (IGES), Computer Graphics Metafile (CGM), or other application specific data interchange software.

   b.   The use of this standard is strongly recommended when one or more of the following situations exist:

   – The data file or database is maintained at a central facility for a decentralized system that employs computers of different makes and models that must utilize the data

   – The data file or database is intended for conversion or is being converted from one computer system to another computer system where the two systems are not necessarily compatible.

   – The data file or database is being migrated from one computer system to another computer system where the two systems are not necessarily compatible.

   – The data file or database is intended for information interchange between a source system and a target system that are not necessarily compatible.

   – The data file or database is intended for archival purposes and the format of and access to a standardized structure is critical to guarantee long life availability and utilization of the data through standardized software support.

   c.   Non-standard features should be used only when the needed operation or function cannot reasonably be implemented with the standard features alone. Although non-standard features can be very useful, it should be recognized that the use of these or any other non-standard elements may make the interchange of data and future conversion to a revised standard or replacement processor more difficult and costly.

9. Specifications. ANSI/ISO 8211-1985, Specification for a Data Descriptive File for Information Interchange (DDF) contains the specifications for FIPS DDF. The ANSI/ISO 8211-1985 document defines the scope of the specifications, control fields, format controls, leaders, directories, and requirements for a conforming implementation. ANSI/ISO 8211-1985 specifies three interchange levels. A level 1 file shall contain elementary character data fields but not compound data fields nor hierarchical structures. A level 2 file shall contain compound data fields but not hierarchical structures. A level 3 file shall contain compound data fields and a list of tag pairs describing the hierarchical structures. All of these specifications apply.

10. Implementation. The implementation of this standard involves two areas of consideration: acquisition of DDF software and interpretations of DDF software.

   10.1 Acquisition of Data Interchange Software. This publication is effective April 1, 1987. Data interchange software acquired for Federal use after this date should implement this standard when the applicability criterion in section 8 has been met. Conformance to FIPS DDF should be considered whether data interchange software is developed internally, acquired as part of an ADP system procurement, acquired by separate procurement, used under an ADP leasing arrangement, or specified for use in contracts for programming services.

   A transition period provides time for industry to produce data interchange software conforming to the standard. The transition period begins on the effective date and continues for one (1) year thereafter. The provisions of this publication apply to orders placed after the effective date; however, data interchange software not conforming to FIPS DDF may be acquired for interim use during the transition period.

   10.2 Interpretation. Resolution of questions regarding this standard will be provided by NBS. Questions concerning the content and specifications of this FIPS PUB should be addressed to:

> Director
> Institute for Computer Sciences and Technology
> ATTN: DDF Interpretation
> National Bureau of Standards
> Gaithersburg, MD 20899

11. Where to Obtain Copies. Copies of this publication are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. (Sale of the included specifications document is by arrangement with the American National Standards Institute.) When ordering, refer to Federal Information Processing Standards Publication 123 (FIPSPUB123), and title. Payment may be made by check, money order, or deposit account.

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